

NEEDS ASSESSMENT FOR A PATIENT CENTERED MEDICAL HOME MODEL OF
CARE AT THE PROVIDENCE ALASKA CANCER CENTER

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NEEDS ASSESSMENT FOR A PATIENT CENTERED MEDICAL HOME MODEL OF
CARE AT THE PROVIDENCE ALASKA CANCER CENTER

A
PROJECT

Presented to the Faculty
of the University of Alaska Anchorage

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Abstract

In order to better understand the needs of cancer patients and allocate resources, the Providence Alaska Cancer Center requested a needs assessment for an oncology focused patient centered medical home (PCMH). A PCMH allows for coordinated and comprehensive care through the use of a teamwork model that centers on the primary care physician. The Providence Alaska Cancer Center staff randomly selected the records of 200 cancer patients between 2010 and 2011, using the cancer tumor registry. Data were analyzed to answer four specific questions that addressed the 1) presence of a Primary Care Physician (PCP), 2) number and type of comorbidities, 3) cancer diagnosis and 4) insurance status impacted emergency room utilization. Individuals tended to utilize the emergency room more if they 1) had a PCP, 2a) had three or more comorbidities, 2b) were diagnosed with hyperlipidemia, chronic obstructive pulmonary disease (COPD) or hypertension, 3) were diagnosed with an “other” cancer as opposed to breast, lung or gynecological cancers or 4) had federal insurance. These data in particular show expected trends such as patients who have more medical complications have higher emergency room utilization rates than patients with less complicated medical history and that certain comorbidities (hyperlipidemia, hypertension and chronic obstructive pulmonary disease) may be predictors of emergency room utilization. These trends may allow providers to create more specialized treatment and care plans for patients at greater risk of emergency room utilization.

Table of Contents

	Page
Signature Page.....	i
Title Page.....	ii
Abstract	iii
Table of Contents	iv
List of Figures	v
List of Tables	vi
List of Appendices	vii
Chapter 1: Introduction to Cancer and its Treatment.....	1
Chapter 2: Introduction to the Patient Centered Medical Home Model.....	4
Chapter 3: Treatment of Cancer in Alaska.....	8
Chapter 4: Study Goals, Rationale, Research Questions and Hypotheses	10
Chapter 5: Methods	16
Chapter 6: Sample Demographics and Description	19
Chapter 7: Results and Discussion	24
Chapter 8: Strengths and Limitations.....	31
Chapter 9: Future Directions	34
References	37
Appendices	40

List of Figures

	Page
Figure 1. Sample comorbidity types	20
Figure 2: Insurance status	22
Figure 3. Number of emergency room visits	23
Figure 4. Mean emergency room utilization by primary care physician status	24
Figure 5. Mean emergency room usage by comorbidity status	25
Figure 6. Mean emergency room usage by cancer diagnosis	26
Figure 7. Mean emergency room usage by insurance status	27

List of Tables

	Page
Table 1. Project practicum projected and completed timeline.....	16
Table 2. Sample demographics of age, race and gender	19
Table 3. Sample cancer diagnosis percentages	21

List of Appendices

	Page
Appendix A: Conceptual Model	40
Appendix B: UAA IRB Exemption Document	41
Appendix C: Providence Waiver of IRB Jurisdiction.....	42
Appendix D: Providence Consent Form	43
Appendix E: Data Collection Spreadsheet.....	45

Chapter 1: Introduction to Cancer and its Treatment

Cancer

Cancer is defined as the uncontrolled growth of cells within the body, and is often represented by solid tissue malignant tumors. There are several risk factors associated with cancer such as smoking, diabetes, diet, exposure to ultra violet radiation, and alcohol use (Houde, Melillo, & Holmes, 2012). By definition, malignant tumors are serious and dangerous to a person's health and well-being, as they have the ability to invade and destroy nearby tissue, and may have the capacity to spread (i.e., metastasize) to other parts of the body or recur following treatment. Cancers are generally labeled to reflect the anatomical sites from which they originate, for instance colon cancer, breast cancer, lung cancer, liver cancer and skin cancer (Panno, 2005). Within anatomical sites, there are different tissue types or variations in cell differentiation that may further modify the classification of the cancer. For example, skin cancer can consist of basal cells, squamous cells or melanocytes. Depending on the cell type, the tumor will exhibit different characteristics.

Typically, cancer is not the only disease to affect cancer patients. Cancer can be accompanied by a host of medical and psychological comorbidities that may have existed before the onset of cancer or come after, as they may be secondary to the disease and/or its treatment. Examples of comorbidities include arthritis, asthma, congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), depression, diabetes, hypertension, injuries, and renal failure (Hudson et al., 2012). By 2030, an estimated 60% of survivors are expected to be over the age of 65, resulting in an increased likelihood for significant comorbidities and further leading to the need for proper comprehensive patient care (Pal & Hurria, 2010). The cancer survivor population in the U.S. was an estimated 11.9 million people in 2008 (Centers for Disease Control and Prevention, 2014a). By 2050, it is expected that the number of cancer survivors will surpass the number of new cancer cases. This shift in patient populations will increase the need for medical and other specialty providers who can treat the diverse issues cancer patients experience and require a more efficient model of patient care, including aftercare (Hudson et al., 2012).

Cancer Treatment

Cancer care is a life changing experience. Cancer care is made up of a complex set of calculations and processes that do not always occur congruently. Cancer treatment can be long and stressful, and may be complicated by the presence of many of the aforementioned comorbidities. Cancer treatment consists of several treatment modalities that may be used individually or in conjunction with each other. Treatment options include radiation, surgery, chemotherapy, and targeted therapy (American Cancer Society, 2015). Patients who undergo treatment for cancer may experience a whole host of side effects associated with therapy such as pain, nausea, vomiting, fatigue, anemia, infection, and depression (American Cancer Society, 2015).

Cancer patients can experience concerns for their physical, mental, and financial health. Cancer patients will face unfamiliar experiences and develop new habits that may include deciding on the appropriate cancer therapy, different diets and lifestyles, and learning about medical treatments and terminology (Panno, 2005). Even after finishing treatment for his/her cancer, the patient will require a follow-up treatment or survivorship plan. This survivorship plan is typically based on the staging and type of cancer, the treatment received, the risk for recurrence or additional cancers and any comorbidities the patient may have. Many patients will have annual check-ups for several years and even then the risk of recurrence still exists (National Cancer Institute, 2010). How patients adapt to their new reality is highly variable. However, some of the best patient outcomes can be attributed to active participation from the patient in managing their cancer treatment and follow-up care, i.e. patient activation (Blinder et al., 2013). Given the diverse needs of cancer patients, it is necessary for comprehensive cancer care to address the biological and psychosocial concerns of cancer patients.

In addition to the routine oncology treatments, emergency services may play an important role for cancer patients. Due to compromised immune systems resulting from cancer treatment and the increase in side effects from more aggressive treatment options currently available, having access to immediate care is often critical (Rovere et al., 2012). Oncologic emergencies that require treatment in an emergency setting can occur over several months or happen in several hours. Cancer emergencies can be categorized as metabolic,

hematologic, structural, or side effects to treatment (Sadik et al., 2014). The most common reasons cancer patients visit the emergency room is to treat the side effects of pain or a high fever (Raji, 2009). In a study in Brazil of the common profile of cancer patients who seek treatment at the emergency room, Rovere et al. (2012) found that patients with urological, breast, gastrointestinal and lung cancers had greater demand for emergency room care.

Cancer patients face a plethora of complications, including complications that may not seem life threatening for a healthy patient. For a cancer patient who is currently undergoing chemotherapy and is therefore immunocompromised, a fever of 101 degrees Fahrenheit may be reason enough to visit the emergency room (Tannebaum et al., 2014). Cancer patients are typically informed to be aware of certain signs and symptoms such as nausea, vomiting, severe diarrhea, bleeding, and shortness of breath. If the patient does experience these side effects during the day the solution may be as simple as contacting their oncologist or primary care provider if they have one. Complications after hours may leave the patient with no choice but to use the emergency room (Tannebaum et al., 2014). Depending on the situation the patient may not need to utilize the emergency room if appropriate access to a primary care provider is available, or if the patient has been well educated about what to do in case these signs and symptoms occur (Tannebaum et al., 2014).

The benefits of emergency room usage are that it is available 24 hours a day and 7 days a week without appointment. There is a greater amount of resources available such as hospital staff, lab, supply, and pharmacy (American College of Emergency Physicians, 2014). Unfortunately these same benefits can be drains on hospital resources if patients utilize the emergency room too much (Tannebaum et al., 2014). Rovere et al. (2012) suggest the need for improved primary care and oncology clinic services in order to meet the demands of oncology patient care so that unnecessary visits to the emergency room could be reduced and/or prevented.

Chapter 2: Introduction to the Patient Centered Medical Home Model

Patient Centered Medical Home

The Patient Centered Medical Home (PCMH) model was first developed in the United States in the 1960s to create a system that fostered comprehensive care and shared decision-making between the patient, primary care providers, other providers, and the patient's family (American Hospital Association, 2010). Patient centered medical homes were originally created to help children with special healthcare needs in the community. In 2004, the American Academy of Family Physicians adopted the PCMH model. Currently the PCMH model is being adapted to different areas of healthcare such as oncology (Houde et al., 2012). The PCMH model helps place a priority on managing the health of patients and increasing access to healthcare (American Hospital Association, 2010).

A PCMH model is a provider-directed medical practice in which the patient's personal provider takes the leading role in a team care approach; the primary care provider is aware of the majority of medical decisions, while responsibility is shared among the team for that patient. Having a primary care provider means the patient has a medical provider who understands his/her individual needs. It allows the patient to build a rapport with that provider, who is the first point of contact for the patient when a medical necessity occurs (Houde et al., 2012).

Some of the numerous benefits of PCMH models include use of electronic medical records (EMRs) to allow better record keeping and communication between providers, increased coordinated care, use of registries to take a population-based approach to care, enhanced access, increased data collection, increased patient satisfaction, whole-person orientation, and improved quality and safety (Houde et al., 2012). Patient Centered Medical Homes also provide a place for current cutting edge technological healthcare applications such as tele-health and mobile health (Hudson et al., 2014). This use of technology could be beneficial by reducing healthcare costs. Finally, PCMH models relate well to the current drive for new payment models to replace the current fee-for-service model and its inability to adapt to comprehensive patient-centered care (Houde et al., 2012).

The PCMH model can increase quality and safety by supporting the use of the most up-to-date evidence-based approaches to patient care (Pal & Hurria, 2010). Patient Centered

Medical Homes can support a wide variety of patients with a range of diseases. These diseases range from chronic illnesses to infectious diseases. Patient Centered Medical Homes, in general, provide a positive effect on outcomes by allowing for better coordination among practitioners treating patients, and by promoting access and active participation by the patient within the healthcare team (Pal & Hurria, 2010). This effect occurs through better communication with patients and a better comprehension of their needs, resulting in better patient outcomes and increased patient satisfaction. Clinical staff are better trained and more engaged in creating efficiencies through team based care. Responsibilities are shared across the entire medical team, which may include nutritionists, behavioral health specialists, and exercise specialists, who are likely to have more targeted and current knowledge of certain areas of healthcare than the physician (Sprandio, 2012).

When discussing the benefits of a PCMH model, it is important to discuss the benefits from an emergency room stand point, which includes certain diagnostic tests being performed at the primary care provider's office instead of the emergency room, which may cut down on the cost of expensive or unnecessary hospital/ER-based testing (Sprandio, 2012). Also, current research has shown that patients who have seen their primary care provider within the last year are less likely to visit the ER than patients who have not seen their PCP within the last year (Chaiyachati et al., 2014).

While the PCMH model offers a variety of benefits, there are drawbacks to the PCMH model such as costs, training, and time (Jackson et al., 2013). One of the greatest challenges facing practices wanting to switch over to a PCMH model is implementation, since the transformation process doesn't occur over weeks but rather years; it can be difficult to track patient and practice progress if the proper monitoring assessments are not in place. Other implementation challenges include there being no one blueprint for the transformation process and comparing medical homes can be difficult due to the different characteristics of patient populations (Jackson et al., 2013).

Patient Centered Medical Homes for Oncology Patients

The application of a PCMH model for oncology patients is limited currently. A literature search revealed just a handful of oncology centers using a PCMH model (Sprandio, 2012). Since it is apparent that a PCMH model can improve patient satisfaction and health

outcomes in family medicine, it is important to explore the positive gains PCMH models can also have for cancer patients. Implementation of a comprehensive care model for cancer care, such as a PCMH model, could provide patients with better cancer treatment, overall care, and improved survivorship (Sprandio, 2012). A PCMH model is one way the complexities of cancer treatment and survivorship care can be streamlined for patients. The desire and need to coordinate cancer treatment and treatment of the host of comorbidities associated with cancer and cancer treatment is growing in the United States (Sprandio, 2012). Patient Centered Medical Homes have been shown to help empower the patient by making the patient part of the healthcare team (Sprandio, 2012). The PCMH model may also provide additional benefits of increased efficiencies and lower costs.

An example of a need for coordinated cancer care is in breast cancer patients, especially among circumpolar populations (Young & Bjerregaard, 2008). In the United States, breast cancer survivors make up 25% of the entire cancer survivor population, making breast cancer patients an ideal population to study for developing better patient care methods. Research has shown that breast cancer patients feel that there is currently a lack of communication between oncologists and Primary Care Physicians (PCPs) (Blinder et al., 2013). Over half of PCPs feel that they receive insufficient information about their patients' cancer diagnoses and treatments (Blinder et al., 2013). The PCMH model offers a model of coordinated care that allows for easier communication between PCPs and oncologists as well as other specialists who make up the comprehensive care team.

While there are many descriptive studies available about PCMH models, more analytical studies are less common. The implementation of PCMH models in an oncology setting has only recently taken hold in the healthcare industry, in part due to recent healthcare reform; therefore, the research is still in its early phases. More quantitative data analysis is necessary to understand the impacts and determine the next questions that need to be asked about the potential benefits of the PCMH model and its application to oncological care.

While PCMH models offer a host of potential benefits such as increased patient health and reduced costs, a major challenge that PCMH models face, is the initial effort and costs of converting to a PCMH model (Weiss, 2013). Many of the upfront costs include the purchase and implementation of an electronic health record, conducting patient satisfaction

surveys, and training employees to engage in team-based care and support patients in proper self-care (Weiss, 2013).

Chapter 3: Treatment of Cancer in Alaska

Alaska is a vast state with varying climate and geographical challenges. The remoteness of the state makes access to nutritious food difficult for many Alaskans, especially in rural areas, which increases the risk of developing diabetes, a known risk factor for cancer (Hudson et al., 2012). Alaskans also have increased rates of alcohol use, another risk factor for cancer, with Alaska having twice the rate of alcohol abuse and dependence compared to the national average (Alaska Department of Health and Social Services, 2012a). Due to increased risk factors, Alaskans have shown to be at increased risk of developing cancer (Alaska Department of Health and Social Services, 2012a).

Across Alaska, 2,136 cancer cases were diagnosed in 2012, with approximately 38,000 new cancer cases being diagnosed from 1996 to 2012 (Alaska Department of Health and Social Services, 2014). Cancer has continued to be a leading cause of death among Alaskans since 1993 (Alaska Department of Health and Social Services, 2012b). Approximately 25% of all Alaska deaths in 2009 were caused by cancer. The most common cancers diagnosed in Alaska were breast, prostate, lung, and colorectal (Alaska Department of Health and Social Services, 2012b). Also, cancer rates are not uniform across the state; instead, there are disparities in both the incidence and mortality of cancer between Alaska Natives and non-Alaska Natives, with Alaska Natives being more likely to be diagnosed with cancer and die following the diagnosis (White et al., 2014). While cancer treatment is a needed focus, there is also an increased need for cancer survivorship programs in the state of Alaska as cancer survival rates continue to increase (Alaska Department of Health and Social Services, 2012b).

The Providence Alaska Cancer Center

Providence Health and Services, as one of the largest providers of healthcare in Alaska, has a responsibility to be responsive to the growing needs of cancer patients in the state of Alaska. The Providence Alaska Cancer Center (PACC) opened in 2007 and its cancer program is accredited by the Commission on Cancer (COC). It provides numerous ancillary services on-site for cancer patients, including navigation services, genetic counseling, oncology-focused physical rehabilitation, wig and prosthesis assistance, financial services assistance, distress screening, a dietary consultative service, a healing arts program, and the

Susan Butcher Family Center. In addition, PACC supports a clinical trials department, a tumor registry, multiple tumor boards, and the hospital medical staff's cancer committee. A survivorship program is also in development at the PACC. A survivorship program helps patients transition from acute cancer care treatment with education, monitoring of long-term side effects and referrals to recovery services. These services include smoking cessation, physical therapy and rehabilitation, nutrition, psychosocial support and counseling, social work and fertility, among others (Providence Health and Services, 2014).

Patient care on site is limited to pediatric oncology, an outpatient infusion center and radiation oncology, with radiation therapy being provided in partnership with an independent physicians group. Other independent but closely aligned cancer-related physician offices in the same building include a medical hematology-oncology group, a gynecologic oncology group, and several private surgical offices. Cancer treatment for patients is primarily directed by independent oncologists, radiation oncologists and/or surgeons. Survivorship care is variable and may or may not stay under the direction of the oncologist, radiation oncologist or surgeon. Currently, there is no formal program or structure in place that enhances the coordinated care of a patient. There are referrals from primary care providers to oncology specialists and some referrals from oncology specialists to primary care doctors, but primary care is not part of the Providence Cancer Center program. Patients are either self-selected or referred from oncology providers to navigation, genetic counseling or oncology rehabilitation. Having a PCMH model might make the selection process less random or biased to certain physicians or patients that are aware of services, and help to ensure that cancer patients have a primary care provider. This project is looking at the implementation of a PCMH model because of the need for improved coordination of patient services inside and outside of the cancer center, with primary care included.

Chapter 4: Study Goals, Rationale, Research Questions and Hypotheses

Study Goals

Provision of a PCMH model at the Providence Alaska Cancer Center is of potential interest to the Providence Alaska Medical Center, healthcare leaders, and public and private payers, given that PCMH models have the potential to provide improved coordinated comprehensive patient care, increased patient satisfaction, cost savings and improved management of the predicted increase in survivorship (Hudson et al., 2012).

The Providence Alaska Cancer Center medical director, Dr. Thomas Mego, has expressed a desire to explore the possibility of implementing a PCMH model within the PACC. Thus, this research project sought to answer several questions about the need for, and potential benefits of, a PCMH model at the Providence Alaska Cancer Center. In addition, Dr. Mego, and Ms. Marian Jones (Administrative Director of the PACC) will use the data collected through this research project to improve the quality of care for patients that are touched by the Providence Alaska Cancer Center.

Specifically, the aim of this project is to better understand the healthcare needs of cancer patients in the PAMC patient population, with a focus on comorbidities, and assess for any gaps in the ability of patients to access the care necessary to meet those needs. Depending on what the data illustrate, further research projects may be needed to determine how to implement an oncology PCMH model, or other form of coordinated care, and what other resources should be available to cancer patients such as mental health services or weight loss services, etc.

Conceptual Framework

The Precede-Proceed Model is an excellent model for analyzing a health situation, understanding it, and designing an effective intervention program. An example of the Precede-Proceed Model can be seen in Appendix A. The Precede-Proceed Model is often thought of as a road map and it provides a structure for applying theories and concepts systematically for planning and evaluating health behavior modification through risk (Glanz, Rimer, & Viswanath, 2008). The eight phase Precede-Proceed planning model consists of four planning phases, one implementation phase, and three evaluation phases. The first four phases can further be classified as the Precede phases and the latter four as Proceed phases.

The Precede phases are designed as planning and assessment phases, while the Proceed phases focus on implementation and evaluation of the desired outcome. Together these phases help researchers focus on the analysis of outcomes by allowing researchers to work backwards to help identify strategies for achieving those objectives (Glanz, Rimer, & Viswanath, 2008). Another benefit of the Precede-Proceed Model is that it helps weigh the costs against the benefits of certain health programs, which is important for any healthcare organization. Through the use of a multi-phasic Precede-Proceed Model, a better understanding of hospital utilization, comorbidities, and how use of general providers affects cancer patients' health outcomes can be gained.

In this model, we seek to better understand Phase Three. Phase three focuses on the behavioral and environmental factors of the population (Glanz, Rimer & Viswanath, 2008). For this project, the representative population is cancer patients who have been treated at the Providence Alaska Medical Center (PAMC). Several factors relate to their health needs including: comorbidities, type of cancer, insurance type, having a general provider, and hospital/emergency department utilization. By better understanding these factors and this population, new models of patient care can be used to improve patient outcomes.

Study Rationale

Several factors related to the healthcare of cancer patients, and possibly with linkage to a coordinated care mode like a PCMH, were selected based on recommendations from the PACC medical director. The characterization of these factors will help determine the need for a PCMH model at the Providence Alaska Cancer Center as well as some of the specific focus areas of a PCMH model. Specifically, this study focused on examining which patient factors influence emergency room utilization. Initially, this project planned to review several types of hospital encounters including emergency room admission, hospital admission, or hospital readmissions; however, only emergency room admissions were able to be collected based on how information was labeled within the medical record. Hospital admissions and readmissions were not collected or examined because of the difficulty of determining if a specific service was inpatient or outpatient without significant time and exploration of each patient's medical chart.

Regardless of this limitation in medical treatment usage, valuable information can still be gleaned from examining just emergency room utilization. By understanding which factors are associated with increased emergency room utilization (which can be an expensive and non-preferable mechanism for regular medical care), recommendations can be made in order to effectively identify and support patients who have high emergency room utilization, and create a PCMH model that is sensitive to the needs of higher risk patients.

The factors that were selected by the medical director for examination included 1) whether or not a cancer patient has a documented PCP, 2) the number and types of comorbidities affecting cancer patients, 3) type of cancer diagnosis, and 4) type of patient insurance.

The presence of a current PCP was a factor to consider. Whether a patient does or does not have a current PCP is important in understanding the health status of a patient. How recently a patient has visited their PCP can tell a lot about a patient's habits as well as how thorough their current medical history may be (Hudson et al., 2012). Patients who do not have a current PCP, and may not have had one for some time, will most likely not have a current medical history and they may have underlying untreated chronic conditions such as arthritis, cardiovascular disease, obesity, and diabetes (Hudson et al., 2012). A lack of a PCP and unmanaged comorbidities may result in unnecessary ER visits and admissions.

The risk of cancer increases with age, as does the risk of developing comorbidities (Pal & Hurria, 2010). Cancer patients 55-64 years old were found to have an average of 2.9 comorbidities. Comorbidities include arthritis, asthma, congestive heart failure, chronic obstructive pulmonary disease, depression, diabetes, hypertension, injuries, pain and renal failure (Pal & Hurria, 2010). The number of comorbidities may affect the diagnosis, treatment and prognosis of cancer. As an example, patients who were treated using neoadjuvant hormone therapy followed by radiation for localized prostate cancer were found to have an increased risk of mortality if they had two of the three risk factors which included coronary artery disease, congestive heart failure (CHF), or prior myocardial infarction. If the patient only had one cardiovascular disease risk factor, they had no increased risk for mortality under the same treatment (Pal & Hurria, 2010). Assessing for comorbidities in the cancer patient population at the Providence Alaska Cancer Center and how they relate to ER

visits was critical to characterizing the need for a PCMH model of care. The number of comorbidities a cancer patient has may play a role in ER usage. By examining the number and types of comorbidities a cancer patient has, a more accurate assessment of the patients' needs may be developed allowing for better-coordinated care during and after cancer treatment (Sprandio, 2012).

Type of cancer was selected for examination because of the diversity in how type of cancer can impact the patient's health and medical treatment. For instance, different types of cancer require different treatments and follow-up plans, with variable risk for treatment related morbidity (side effects) and need for emergent care (Sprandio, 2012). Also, there may be a relationship between different cancer types (e.g., breast cancer versus colon cancer) any unique types of comorbidities that may also impact how patients utilize medical services such as the ER. These comorbidities may be caused by treatment or may have been already present (Pal & Hurria, 2010).

Insurance status and type was the final variable selected for examination, as insurance type may be related to socioeconomic status and overall health and wellbeing, as well as ability to pay for care. Insurance type and status was selected to determine if there was a difference between patients with public insurance (Medicare/Medicaid/Veteran's Affairs) and patients with private insurance. Medicare is a social insurance provided by the federal government (Centers for Medicare & Medicaid Services, 2015). Medicare is used to cover senior citizens and certain disabled individuals. Medicaid is an insurance program, which covers very low-income children and their families (Centers for Medicare & Medicaid Services, 2015). Both the federal government and state government jointly fund Medicaid. This variable was important to help establish a better understanding of how cancer patients with different insurance types may utilize hospital resources differently and may allow the Providence Alaska Medical Center to better communicate with the State of Alaska as well as private insurance companies to help promote preventative efforts in order to help reduce ER usage.

Research Questions

Research questions were developed based on the information presented above regarding factors of cancer patients that could impact hospital usage. The four research questions were used to guide the research project, and included:

- 1) Is there is a difference in emergency room usage between cancer patients without general providers and with general providers?
- 2) a) Does the number of patient comorbidities impact emergency room usage?
b) Which specific comorbidities are the best predictors of emergency room usage?
- 3) Does type of cancer impact emergency room usage?
- 4) Does type of insurance (private versus public) impact emergency room usage?

Hypotheses

Hypotheses were generated based on the selected research questions in order to guide data analysis and interpretation. The first two hypotheses are directional, with a specific type of relationship being predicted between the grouping variable and the dependent variable of emergency room utilization, while the final three hypotheses are non-directional and instead predict that a difference will exist between the factors with regard to the level of emergency room utilization.

Hypothesis 1: Patients with general providers will utilize the ER less than patients who do not have a general provider.

Hypothesis 2a: Patients who have three or more comorbidities will utilize the emergency room more than patients with less than three comorbidities.

Three comorbidities was used as a cutoff for this research question based on previous research by Pal and Hurria (2010) that found that cancer patients above age 55 had on average 2.9 comorbidities.

Hypothesis 2b: There will be a difference in emergency room utilization depending upon type of comorbidity present.

Hypothesis 3: There will be a difference in emergency room utilization depending on the type of cancer diagnosis.

Hypothesis 4: There will be a difference in emergency room utilization for patients who have private insurance versus patients who have insurance through the public system.

Chapter 5: Methods

Timeline

A schedule was created in order to ensure the project was completed in a timely manner. Tasks included proposal development and approval; Institutional Review Board (IRB) credentialing and approval (through both UAA IRB and the Providence Research IRB); data collection, data analysis, and report and presentation development. Modifications to the timeline were made following greater than anticipated times in terms of approval from the UAA IRB board and collection of data by the research volunteer at the Providence Alaska Cancer Center. The following Table 1 includes both the initial projected completion dates for various project tasks, as well as the actual completion dates for these tasks.

Table 1. Project practicum projected and completed timeline.

Task	Projected Completion Date	Actual Completion Date
Initial Project Draft to MPH Committee	November 1, 2014	October 16, 2014
Project Submission to UAA IRB	Early November 2014	December 19, 2014
Revisions made based on UAA IRB feedback/Receive IRB approval	End of November 2014	March 20, 2015
Approved Protocol Submitted to Providence Research IRB	December 2014	March 20, 2015
Approval from Providence Research IRB	December 2014	March 24, 2015
Data Collection Begins	December 2014	May 2015
Data Collection Ends	January 2015	June 2015
Data Analysis	January 2015	July 2015
Project Practicum Presentation	February 2015	September 2015
Written Report Presented to MPH Committee	March 2015	September 2015

Protection of Human Subjects

Data were protected in conjunction with the Providence Alaska Medical Center's risk management and clinical trials departments, and per approved UAA IRB protocol. See Appendix B for the IRB approval letter and Appendix C for the letter of approval from the Providence Research IRB for this project. Data were stored on a password-protected computer that remained at Providence. The raw data are only accessible to Dr. Mego. The Principal Investigator only had access to the de-identified data. Data will be stored for up to 10 years.

Based on the protocols, several considerations for the protection of human subjects in this archival study were made. The sample selected from the tumor registry was random. No personal identifiers were used in the presentation of the data. No interaction was made with patients directly nor will care or treatment of the current study patients be modified due to this research project. Patients of PAMC signed a consent form upon admission (see Appendix E) indicating that information may be used for Providence Health and Services Business Operations.

Data Collection

Data for this project were collected in a multi-stage process. The first stage included random sample selection. This stage utilized the tumor registry database for the Providence Alaska Cancer Center. Tumor registry staff randomly pulled 200 cancer patients that were treated at Providence between 2010 and 2011. In the initial power analysis, it was determined that two hundred patients were required to demonstrate a moderate effect. Using G-power, it was found that one-hundred and twenty-eight cancer patients was the minimum population required to run the statistical tests for the data analysis. Realizing that some patient charts may not have all the data the research project was interested in, Dr. Mego and the Principal Investigator determined 200 patients to be a reasonable number to establish statistically relevant and useful data.

The tumor registry data was accessed through Metriq database and included information such as the cancer type for each patient selected. The second stage of data collection was the retrieval of patient demographic information as well as medical information that was pertinent to research questions. This information was housed within the

Providence Health Information System (Epic). Demographic data that was collected included age, gender and racial/ethnic group. Medical information that was pulled included 1) patient comorbidities, 2) emergency room encounters, 3) type of insurance, 4) presence of Primary Care Physician (PCP), and 5) type of cancer. For the comorbidities data, a literature review done by Pal and Hurria (2010) identified the most common comorbidities associated with cancer patients. From this literature, Dr. Mego and the Principal Investigator selected the ten comorbidities that were examined for this study including: arthritis, asthma, congestive heart failure, chronic obstructive pulmonary disease, depression, diabetes, hypertension, injuries, pain and renal failure. This data included searching for Current Procedural Terminology (CPT) codes related to the 200 patients' comorbidities and hospital encounters.

A research volunteer from the Providence Alaska Cancer Center manually collected the data by reviewing the charts of the patients who were randomly selected. This volunteer was trained with respect to proper protocols for data collection and protection, and only provided a de-identified Excel spreadsheet to the Principal Investigator for analysis (See Appendix E).

Chapter 6: Sample Demographics and Description

Demographics

A random sample of 200 patients from the Providence Alaska Cancer Center tumor registry was selected out of the approximately 1,200 cancer patients who received services at PAMC in 2011. The mean age of participants was 61.95 (SD = 15.6), ranging from 4 to 94 years old. The sample was primarily female (65%) and Caucasian (83.5%). A small segment of the sample did not have their racial group documented within the medical record. See Table 2 for a demographic breakdown of the sample by age, race and gender. The sample appeared to have more females than males; this difference is likely due to the cancer sites prevalent at PAMC.

Table 2. Sample demographics of age, race and gender

Demographic Variable	Sample (N = 200)
Age	61.95 (15.6)
Gender	
Female	65%
Male	35%
Race	
Caucasian	83.5%
African American	6.0%
Asian	4.5%
Alaska Native/American Indian	3.5%
Hispanic**	1.5%
Unknown/Other/Multiracial	1.0%

Primary Care Providers

Each patient's medical record indicated whether or not the patient had a Primary Care Physician (PCP) and provided the name of the PCP. The majority of the sample did have a primary care physician (84.5%).

Comorbidities

Out of the possible 10 comorbidities that were examined, the number of documented comorbidities in individual patients ranged from 0 to 6, with an average of 1.33 (SD = 1.4) comorbidities. When breaking down the number of comorbidities into categories (i.e., less

than three comorbidities or three or more comorbidities), approximately 80.5% of the sample had less than three comorbidities, illustrating that only a fifth of the sample was placed into a higher risk group based on the number of comorbidities. The specific type of comorbidities varied in prevalence, with hypertension (40.5%), depression (16.5%), diabetes (15.5%) and hyperlipidemia (15%) being the most common types of comorbidities associated with cancer patients in this sample. Three of these comorbidities are linked to increased risk of cardiovascular disease, and hypertension has been shown to be twice as prevalent in patients with diabetes than patients without diabetes (American Heart Association, 2012). The least common comorbidity was injuries, with 0 percent of the sample having a documented injury in their medical chart. See Figure 1 for a graphic display of the percentage of patients having each type of comorbidity.

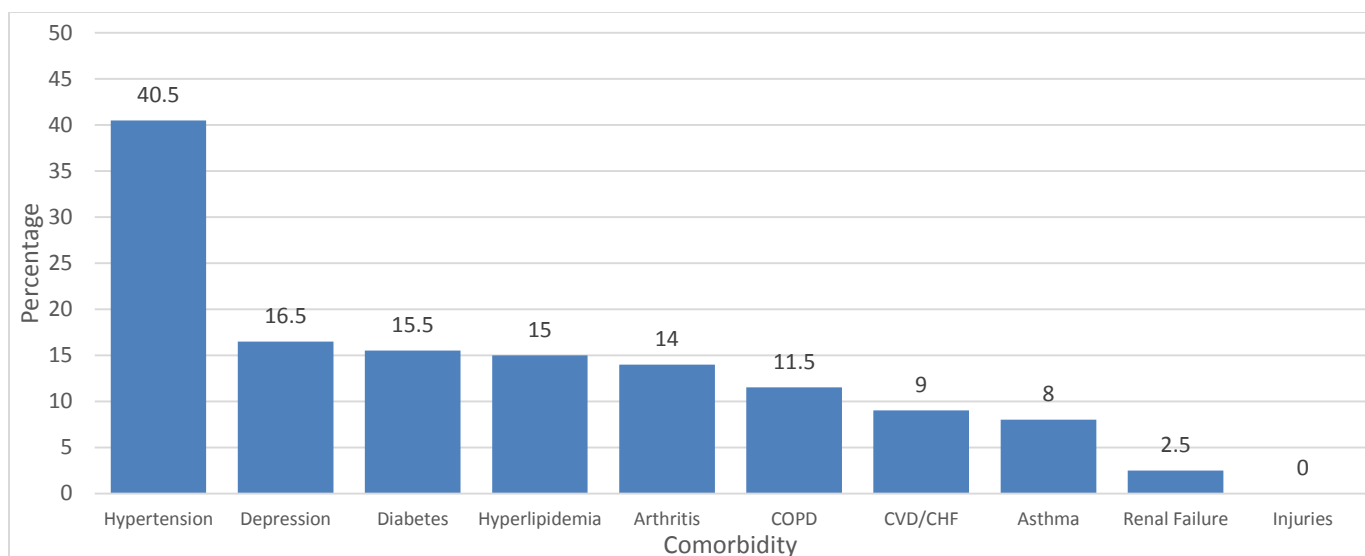


Figure 1. Sample comorbidity types

Cancer Diagnosis

There was diversity in sample patient cancer diagnosis. Table 3 includes the percentage of the sample that was diagnosed within each cancer category in the order of most represented in the sample, to least represented. National rates from the National Institute of Cancer of new cancer cases by cancer type diagnosed between 2008 and 2012 are also included for comparison, although some cancer types did not have rates displayed. The top

three most common cancer diagnoses included breast cancer (27%), lung cancer (13%) and gynecological cancers such as ovarian, uterine, fallopian and endometrial cancers (12%). A small portion of the sample (2%) had an unknown cancer diagnosis according to documentation within the electronic medical record, possibly based on difficulty determining the site of original cancer that had metastasized.

Table 3. Sample cancer diagnosis percentages vs. national

Cancer Diagnosis	Sample %	National %*
Breast	27.0%	14%
Lung	13.0%	13.3%
Gynecological**	12.0%	5.7%
Brain	6.5%	1.4%
Large Intestine/Rectum	5.0%	8.0%
Liver/Bile Duct	4.5%	2.2%
Bladder	4.0%	4.5%
Thyroid	4.0%	3.8%
Bone	3.5%	0.2%
Kidney	3.0%	3.7%
Pancreas	3.0%	3.0%
Prostate	3.0%	13.3%
Lymphoma	2.5%	4.8%
Oral	2.0%	2.8%
Unknown	2.0%	-
Skin	1.5%	4.5%
Soft Tissue	1.5%	unknown
Small Intestine	1.0%	0.6%
Stomach	0.5%	1.5%
Thoracic	0.5%	unknown

*percentage of new cancer cases in # that are diagnosed based on data from the National Cancer Institute:
<http://seer.cancer.gov/statfacts/more.html>

** includes ovarian, uterus, fallopian tube, vulvar and cervical

Insurance

Information in the patient medical records indicated the patient's insurance status and documented which insurance the patient utilizes. A wide variety of insurances were used, both commercial (i.e. Premiera Blue Cross, Wells Fargo, Aetna, Meritain Health, etc.) and public insurance programs (i.e., Medicare, Medicaid, Veterans Affairs (VA) insurance).

Several patients had double coverage of insurance, and thus were coded for insurance category (commercial versus public) based on their primary insurance. There were roughly equal rates of patients with commercial (39.5%) and public (42%) primary insurance. The most common type of commercial insurance was Premier Blue Cross Blue Shield while the most common type of public insurance was Medicare. The remaining percentage of the sample (18.5%) had either an unknown insurance status, were self-pay or had services provided through charity or Project Access, a provider network that helps low income patients get needed specialty medical care (Anchorage Project Access, n.d.). See Figure 2 for a graphic display of the insurance status of the sample.

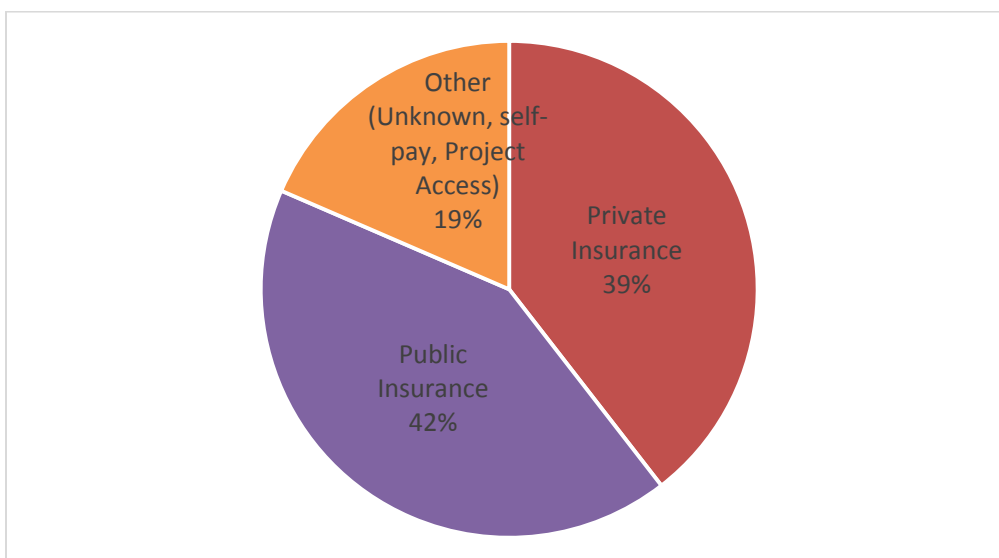


Figure 2: Insurance status

Emergency Room Utilization

A records review was performed for each patient in the sample, where the research assistant compiling the data counted the number of Emergency Room visits that were documented in a patient's chart from the time of their cancer diagnosis. Emergency Room visits ranged from 0 to 11 visits, with a mean of 1.4 ($SD = 2.1$). The results were positively skewed, with 45 percent of the sample having no emergency room visits. See Figure 3 for a graphic display of the number of patients by Emergency Room visits.

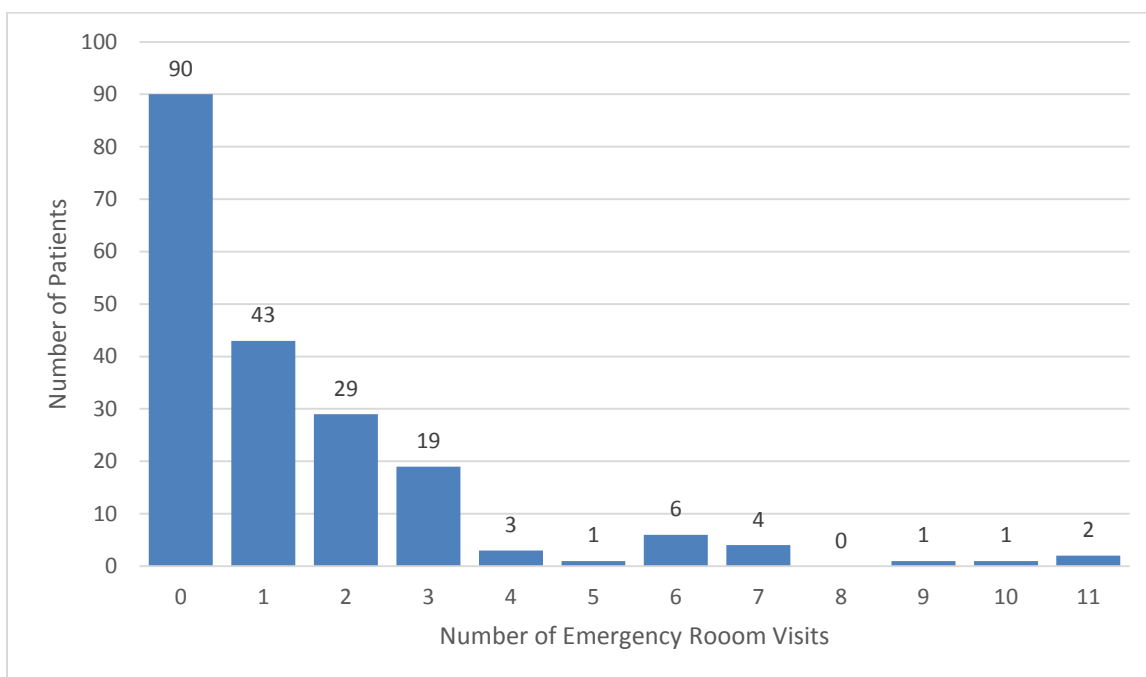


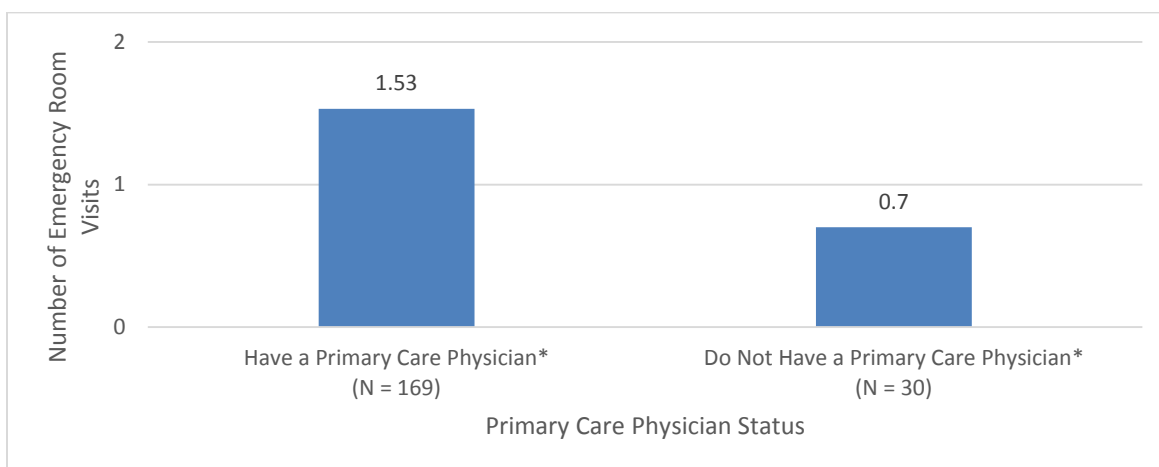
Figure 3. Number of emergency room visits

Chapter 7: Results and Discussion

Results

Primary Care Provider

The first question was to determine whether or not there is a difference in emergency room (ER) utilization (i.e. number of ER visits) by cancer patients with primary care providers and cancer patients without primary care providers. To explore this question, an independent samples t-test, with an independent variable of presence of primary care provider and a dependent variable of number of emergency room visits, was conducted. The independent samples t-test was significant, $t(77.83) = 3.21, p = .002$, with individuals who have a primary care physician having a significantly higher mean number of emergency room visits ($M = 1.53, SD = 2.1$) than patients who do not have a primary care physician ($M = 0.7, SD = 1.1$). See Figure 4 for a graphic display of the mean differences. Emergency room utilization rates for individuals with a PCP ranges from 0 to 11 visits, while those without a PCP ranges from 0 to 4.



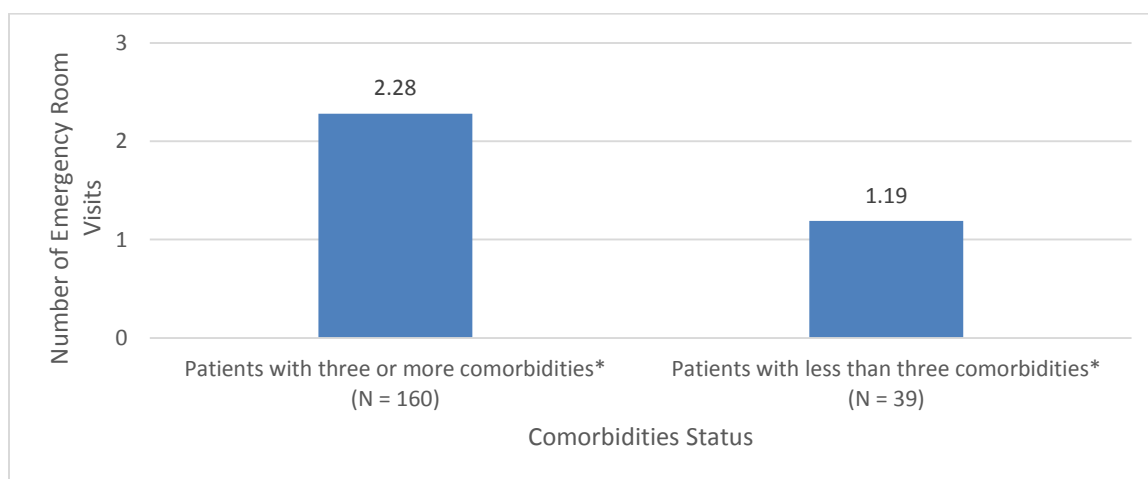
*statistically significant differences between the groups at the $p < .05$ level

Figure 4. Mean emergency room utilization by primary care physician status

Comorbidities

The second question was whether cancer patients who have three or more comorbidities differ in ER utilization from cancer patients with less than three comorbidities. An independent samples t-test was used to explore this question, with an independent

variable of number of comorbidities (with participants being grouped into those who have equal or greater than average number of comorbidities and those who have less than average number of comorbidities according to Pal and Hurria's (2010) research and a dependent variable of number of emergency room encounters. The independent samples t-test was significant, $t(48.96) = -2.4, p = .014$, with individuals who have three or more comorbidities having a significantly higher mean number of emergency room visits ($M = 2.28, SD = 2.5$) than patients who has less than three comorbidities ($M = 1.19, SD = 1.9$). See Figure 5 for a graphic display of the mean differences.



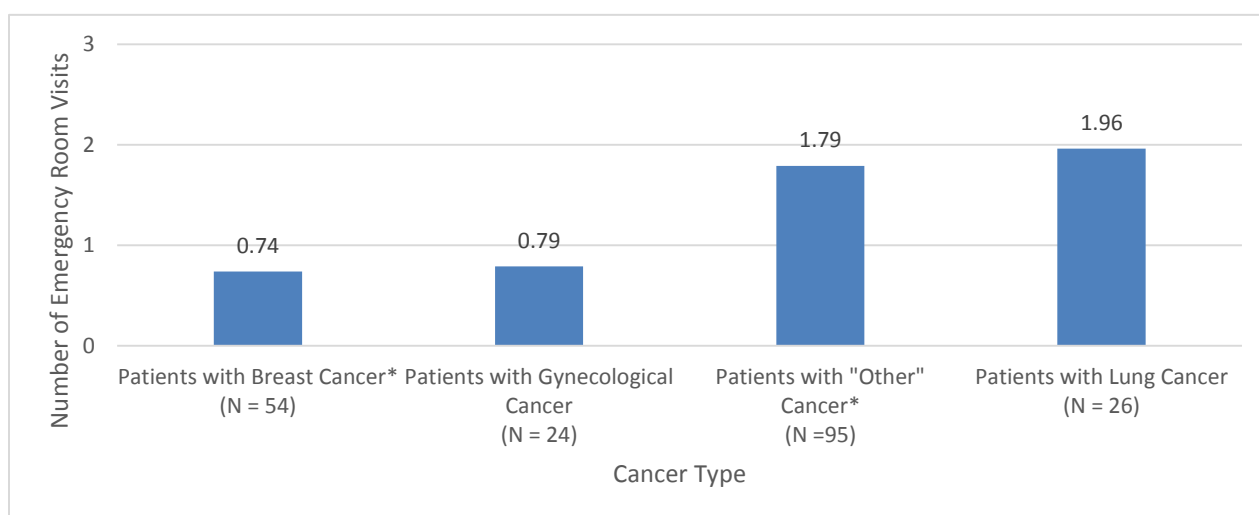
* statistically significant differences between the groups at the $p < .05$ level

Figure 5. Mean emergency room usage by comorbidity status

The third question related to which comorbidities best predict emergency room utilization. Specific comorbidities that were examined included arthritis, asthma, congestive heart failure, chronic obstructive pulmonary disease, depression, diabetes, hypertension, injuries, pain and renal failure. To examine this question, a Poisson regression was used to predict the dependent variable of emergency room visits by the predictor variables of the 10 types of comorbidities. Overall, findings from the model with all ten predictors were statistically significant. Within the model, three of the predictors were significantly associated with elevated emergency room utilization: COPD ($p = .000$); hyperlipidemia ($p = .029$) and hypertension ($p = .010$).

Cancer Type

The fourth question relates to how cancer diagnosis impacts emergency room usage. Given that there were so many cancer types with very small sample sizes, a new variable was created that had the top three most common cancer types (i.e., breast cancer, lung cancer and gynecological cancers) with the remaining diverse cancers being grouped into an “other” category. A one way ANOVA was run to examine differences between these four groups in terms of emergency room usage. Overall, there were differences between the groups, $F(198, 3) = 4.53, p = .004$. Post hoc analyses indicated that there were significant differences between two groups: individuals with a breast cancer diagnosis have significantly fewer mean emergency room visits ($M = 0.74, SD = 1.95$) than individuals in the diverse “other” category ($M = 1.79, SD = 2.25$), $p = .013$. While patients with lung cancer had the greatest mean emergency room utilization, the small sample size possibly impacted the ability to show statistically significant differences between other groups. See Figure 6 for a graphic display of the differences.



* statistically significant differences between the groups at the $p < .05$ level

Figure 6. Mean emergency room usage by cancer diagnosis

Insurance

The final research question addressed whether insurance status is associated with emergency room utilization rates. A one-way ANOVA was used to explore this question,

with an independent variable of insurance status with participants being grouped into those who have commercial insurance, public insurance or other payment (i.e., unknown, self-pay or charity), and a dependent variable of number of emergency room encounters. The overall ANOVA was significant, $F(196,2) = 11.1, p < .001$. Post hoc analyses revealed differences between individuals who have public insurance ($N = 83$) and the two other groups, with individuals who have public insurance having a significantly higher mean number of emergency room visits ($M = 2.06, SD = 2.6$) than patients who have private insurance ($N = 79$), ($M = 0.62, SD = 0.9$) ($p < .001$) and individuals ($N = 37$) in the “other payment” group ($M = 1.62, SD = 1.9$) ($p = .03$). There was not a statistically significant difference in emergency room utilization between those with public insurance and those in the other payment category ($p = 0.5$). See Figure 7 for a graphic display of the mean differences.

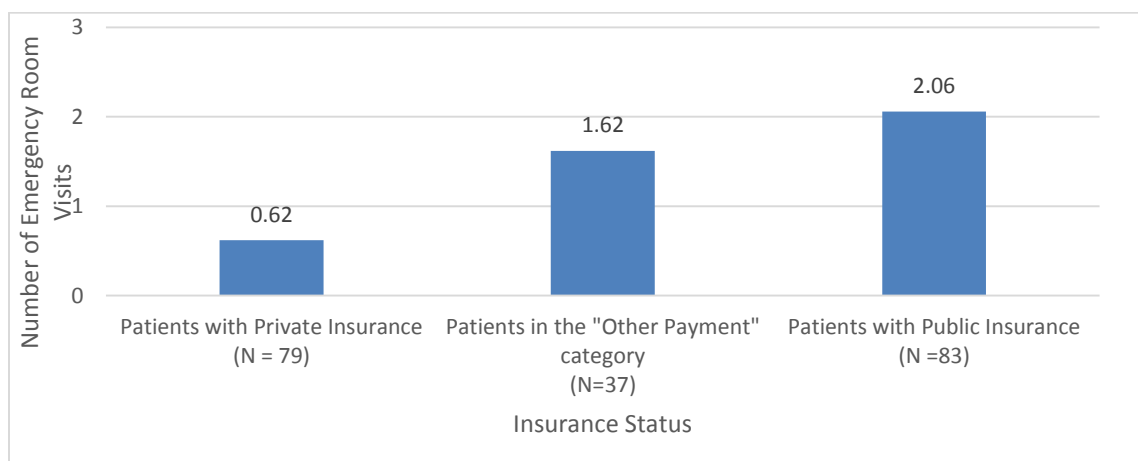


Figure 7. Mean emergency room usage by insurance status

Discussion

For this project, three of the 10 essential public health services were used to ascertain what level of care cancer patients are receiving at the Providence Alaska Medical Center and how that care can be improved. The three essential services include monitoring, investigating, and informing.

The main purpose of this project is to inform the Providence Alaska Medical Center Cancer Committee on how cancer patients are utilizing PAMC services. From this data, it

may be possible to determine if the implementation of a PCMH model would better assist patients at PACC.

Based on the results, there are several interesting findings with regard to factors that impact emergency room utilization rates for cancer patients. Interestingly, in this sample, patients who have a primary care physician have higher emergency room utilization rates than patients who do not have a primary care physician. The causal mechanism that produces this relationship is unknown. It is possible that patients who have a primary care physician are given guidance from this PCP in order to seek needed intervention, whereas patients who do not have a PCP who might experience the same symptoms but do not have the medical guidance, do not seek treatment for those same symptoms. Other variables could control the relationship as well. For instance, patients in this sample who have a PCP have a significantly higher number of comorbidities ($M = 1.46$, $SD = 1.4$) compared to patients who do not have a PCP ($M = 0.61$, $SD = 0.99$), $t(54.3) = 4.09$, $p < .001$. Therefore, perhaps comorbidities explain this relationship, with people with more health complications being more likely to seek regular emergency room treatment. However, this relationship too could be not entirely accurate. Perhaps individuals who regularly see a PCP will have their health status, including their comorbidities, entered into their health record, whereas patients without a PCP might have similar health concerns, but they are not adequately documented due to the lack of medical checkups. Another possibility that may help explain why cancer patients with PCPs utilized the Providence emergency room more than cancer patients without PCPs could be geographical. Cancer patients living in outlying areas close to the Municipality of Anchorage who experience a medical emergency might not use the Providence Emergency room, due to factors such as proximity; instead those patients are more likely to use Matsu Regional Hospital or other closer hospitals. This factor would not be captured by these data and would present an inaccurate breakdown of patient emergency room utilization. This possibility therefore might explain why our results do not parallel current literature. Future studies are needed in order to verify this finding and examine factors that influence it.

Comorbidities appear to greatly impact cancer patients' medical treatment. Not surprisingly, patients who have more complicated medical needs (i.e., greater number of

comorbidities) utilize the emergency room more than patients with less complicated medical needs. Interestingly, some comorbidities are better predictors of patients seeking medical treatment than other comorbidities. Specifically, patients who experience COPD, hyperlipidemia and hypertension are more likely to seek emergency room treatment. In a patient centered medical model, these patients could benefit from more specific treatment plans outlining their medical care.

With regard to cancer type, there is an interesting finding pertaining to patients with breast cancer utilizing the emergency room less than patients who are in the “other” cancer diagnosis category. Breast cancer patients represented 27% of the random sample compared to 14%, which is the national average of cancer patients. This is most likely due to breast and gynecologic surgeons using PAMC. Given the high rates of breast cancer, the Providence Cancer Center has several support services particular to this cancer group. While breast and gynecologic cancer patients utilize the emergency room less frequently when compared to other groups, the underlying mechanism remains unknown. There could be a difference between comorbidities within the breast and gynecologic cancer populations compared to the lung and other cancer populations. For instance, breast cancer patients may have healthier lifestyle choices compared to individuals with lung cancer, which is a cancer that has a lot of lifestyle risk factors such as smoking. Interestingly, lung cancer patients had the highest emergency room utilization ($M = 1.96$, $SD = 1.9$), but given their low sample size ($N = 26$), it is likely that there was not enough statistical power to examine differences between this group and the other cancer groups. This finding possibly points to this cancer group in particular having a high need for medical services, and thus might especially benefit from more coordination in care. However, this result, since it is based on a small sample size, might not be representative for all patients who experience lung cancer.

In the analysis of data on insurance type, it was revealed that patients with public insurance were more likely to use the emergency room than patients with commercial insurance. Several reasons may account for this finding; one such reason for the difference could relate to age. Individuals in this sample with commercial insurance were younger ($M = 56.5$, $SD = 13.2$) whereas individuals with public/federal insurance were older ($M = 69$, $SD = 15.9$), $t(161) = -5.47$, $p < .001$. Comorbidity prevalence increases with age. Perhaps age better

accounts for the increase in emergency room utilization rates than insurance status alone. During the analysis of insurance type, population sizes were not large enough to determine if there was a difference between Medicare patients ($N = 57$) and Medicaid patients ($N = 15$) with regard to emergency room usage. If there was a difference between patients with Medicare and patients with Medicaid, this information would be helpful to the state in helping increase preventative efforts for those patient populations in order to drive down future healthcare costs. As with the primary care physician status, perhaps comorbidities explain this relationship as well. For instance, patients in this sample who have federal (public) insurance have a significantly higher number of comorbidities ($M = 1.85$, $SD = 1.4$) compared to patients who have private insurance ($M = 1.05$, $SD = 1.2$), $t(161) = -3.94$, $p < .001$.

Chapter 8: Strengths and Limitations

Strengths

There are a few strengths that are particular to this study. First, this study utilized data from an electronic medical record, which allows for better data capture and collection. This strength also ties into lower costs for research studies such as this. Also data collection of this nature is typically easier to analyze. In addition, the setup of Alaskan healthcare possibly allowed for greater accuracy in the data collection, since PAMC is one of three major healthcare resources within the Anchorage area and PAMC has the only designated cancer center within the state. Another strength of this study was the support from the Providence Cancer Center Medical Director, as well as the Cancer Center staff. With their support, access to information in order to carry out this study was a smooth process.

Limitations

As with any study, there are several limitations. One limitation relates to the limited information related to seeking medical treatment. Originally, this study hoped to examine multiple types of treatment, including emergency room visits, hospital admissions and hospital re-admissions. Given the difficulty in collecting the hospital admission and re-admission information from the medical record (with having to go through each individual patient encounter), only emergency room visits were able to be examined, which gives a limited picture of patient medical treatment. In addition, the reasons for emergency room visits was not able to be documented, which could have helped to illuminate other factors that relate to cancer patients medical treatment.

Another limitation mentioned previously related to the documentation of comorbidities. It is possible that some comorbidities, especially for individuals who did not have a primary care physician, might be present but not reflected in the medical record due to physician error or the patient not being seen regularly to be assessed. For example, the second most common comorbidity in this study (depression) is commonly under diagnosed, especially in medical settings (Mojtabai, 2014). If comorbidities are not accurately and consistently being assessed and/or documented in the medical record, then the relationships identified between different types of comorbidities and patient medical treatment might be inaccurate.

The smaller sample sizes for some of the comorbidities could be another limiting factor. All of the comorbidities except one (hypertension) had a sample size below 40. These low numbers may have made it difficult to examine specific relationships between individual comorbidities and emergency room usage. This analysis was added after the initial power analysis. The power analysis was not redone. Even if the power analysis had been redone it would be likely that a much larger data sample would be required, which would be logistically impractical due to time constraints, need to get renewed IRB approval and practical limitations based on the initial size of cancer patients seen at the PACC.

With regard to categorizing patients who had a primary care physician, we were also unable to examine the last time the patient actually saw the PCP to verify that they had an active primary care physician. In one study by Chaichatchai et al. (2014), data analysis showed that patients who had seen their PCP within the last year were less likely to use the emergency room. Having this data on the last visit with a PCP might have made it possible to more accurately categorize patients who are actively seeing a PCP and those who are not.

Another limitation of this research project was determined that the sampling frame was too broad. This limitation was only found out after the data analysis. Though the literature supports lower emergency room utilization by patients with current PCPs, this project found did not support that finding. In trying to determine why, the observation was made that a large number (90 patients) did not utilize the emergency room. As was mentioned early in this paper, Alaska is a large state with a lot of geographical variation. While these patients may have been seen at PAMC for cancer services, that does not mean they utilized PAMC for all services. If a patient lived in a different part of the state, they may have utilized other hospitals resources and that data would not have been collected during this study. By not selecting the sample based on patients who would utilize services within the Anchorage area, and PAMC in particular, patients were introduced to the sample who were impossible to collect accurate medical data on. Because of this, data such as emergency room usage might not be entirely accurate.

In examining the results of this study, it is important to remember that given that this study examined a single time point, some dynamic relationships such as causal temporal relationships cannot be verified. Some of the relationships in the data that were found may

have been pre-existing prior to specific factors such as cancer diagnosis or development or specific comorbidities. In addition, given the small sample sizes in some groups, such as the number of patients with lung cancer, it is possible that segments of the sample size, or even the whole sample size of 200 patients, still might not be representative of all the 1200 PACC cancer patients, despite the use of random selection.

A final point of consideration is whether the data is clinically significant or not. Since the data set is not as specific as needed to make more accurate suggestions that could then go on to impact patient care, then this data is not clinically significant. With future research and further refinement of the research questions regarding patients with PCPs and emergency room utilization, future data that is clinically significant may be ascertained; but at this time, this data shows that there are interesting trends occurring at PACC and that future investigation should be considered.

Chapter 9: Future Directions

Plans for Dissemination

There are a number of plans for dissemination of this project in order to fulfill the requirements of a project practicum and to meet the needs and wishes of the Providence Cancer Center. In terms of requirements for the UAA Masters of Public Health Project Practicum, results will be disseminated through an oral presentation of this project practicum to the project committee, the University of Alaska Anchorage faculty, and general public.

Additional plans for dissemination have been made to address the needs of the Providence Alaska Cancer Center. A presentation to the Providence Cancer Committee during one of their quarterly meetings will occur in order to present the findings. Following the initial presentation of the data, the Cancer Committee will discuss how to utilize these findings at the PACC. Dr. Mego and the Providence Cancer committee will determine 1) what additional data they may need to investigate in order to develop a more complete picture of the need and potential use of a PCMH model and 2) whether a PCMH model is desirable and feasible for cancer patients at Providence Alaska Medical Center. Additionally, Dr. Mego could present the findings to the Providence Alaska Cancer Center executive leadership in order to get broader support for additional research and/or changes in the PACC in order to adopt a PCMH model.

Plans for Future Studies

As this study was a preliminary examination into the developmental needs of a possible Patient Centered Medical Home at the Providence Alaska Cancer Center, additional information will likely be needed based on feedback and questions from the PAMC Cancer Committee and PAMC Cancer Center leadership. Future MPH students in conjunction with Dr. Mego and the Providence Alaska Cancer Center could conduct further research directed towards implementation of a PCMH model or other model of coordinated care, as well as participate in future program evaluation.

A potential area of future research could be to further explore why patients with PCPs in this sample seemed to have higher emergency room utilization. To answer this question, information would need to be gathered from patients and their primary care physicians, and

there needs to be a more detailed analysis of the encounter notes for each emergency room visit, in order to determine the reason why patients with a PCP seem to be utilizing the emergency room at a greater rate. Currently, there is limited research in regards to if there is a difference in how urban patients utilize the emergency room versus rural patients. The limited literature does suggest that patients living outside an urban area are more likely to utilize the emergency room than patients living in an urban area (Gindi, Cohen & Kirzinger, 2012). In order to get a better understanding of ER utilization by cancer patients seen at the PACC, a future investigator should structure their study to capture all ER visits by the cancer patients, and not be limited to identification of PAMC ER visits. This could be done best by interviewing cancer patients and providers in the future to get a better understanding of true emergency room utilization rates among cancer patients at the PAMC and to determine the factors leading to emergency room utilization.

It should also be determined how active a patient is with their PCP, e.g. when a patient last had an appointment with their PCP. If the patient has a PCP listed but has not actually seen the PCP within the last year, this needs to be taken into consideration. Current literature indicates that frequency of visiting a PCP impacts ER utilization rates, but this relationship could not be verified with this data and with this patient population (Chaiyachati et al., 2014). This information could have implications for how often patients visit their PCP, should PACC utilize a PCMH model. For instance, if the high utilizers of the emergency room were found to not regularly see their PCP despite having an active one listed, then additional interventions could be used in order to increase their motivation and ability (i.e. through taxi vouchers, etc.) to regularly see their PCP.

Determining which cancer patients utilized the emergency room is also important. In one study fever, shortness of breath and pain were common ailments for cancer patients admitted to the emergency room (Sadik et al., 2014). In the same study, it was observed that approximately half of lung cancer patients that utilized the emergency room had passed away after their first emergency room utilization. This result implies that emergency room utilization is a poor prognostic factor for lung cancer patients. Along a similar line, determining if the patient was admitted to the hospital after being admitted to the emergency room as well as when the patient was discharged would be interesting data to help determine

hospital resource utilization and patient outcome. This data may help to refine care of cancer patients. Cancer patients just like any patient and are not two-dimensional in behavior. A future study should also look at what stages of cancer treatment patients are utilizing the emergency room. Using EPIC, future research could determine when the initial diagnosis of cancer was made and then determine not only how often emergency room utilization occurred, but the frequency of emergency room visits after the initial diagnosis. This may aid healthcare providers in being more aware of cancer patient behaviors when determining emergency room utilization, and could help inform intervention plans for patients at different points in treatment. One retrospective study, that observed 113 cancer patients found that as cancer stage increased so did emergency room utilization (Kotajima, Kobayashi, Sakaguchi, & Nemoto, 2014).

Another area of interest will be to increase the sampling size in order to determine if cancer patients with Medicare versus Medicaid versus Veteran's Affairs utilize the emergency room more often or not. This analysis could not be run during this project based on the small Medicaid population in the sample. If it was found that Medicaid patients used the emergency room more often, then this might lead to an increased state effort to help with the implementation of a PCMH model in order to increase state savings by potentially reducing emergency room utilization.

As was mentioned earlier in this paper, medical practices transitioning to a PCMH model are not able to just flip a switch and convert over to that model of patient care; significant time, money, resources and a proper implementation strategy are all required for success. Future research should be devoted to further characterize the needs of the PAMC cancer patient population to determine how best to utilize the resources available to the PACC to implement a coordinated care model, and what that coordinated care model should look like.

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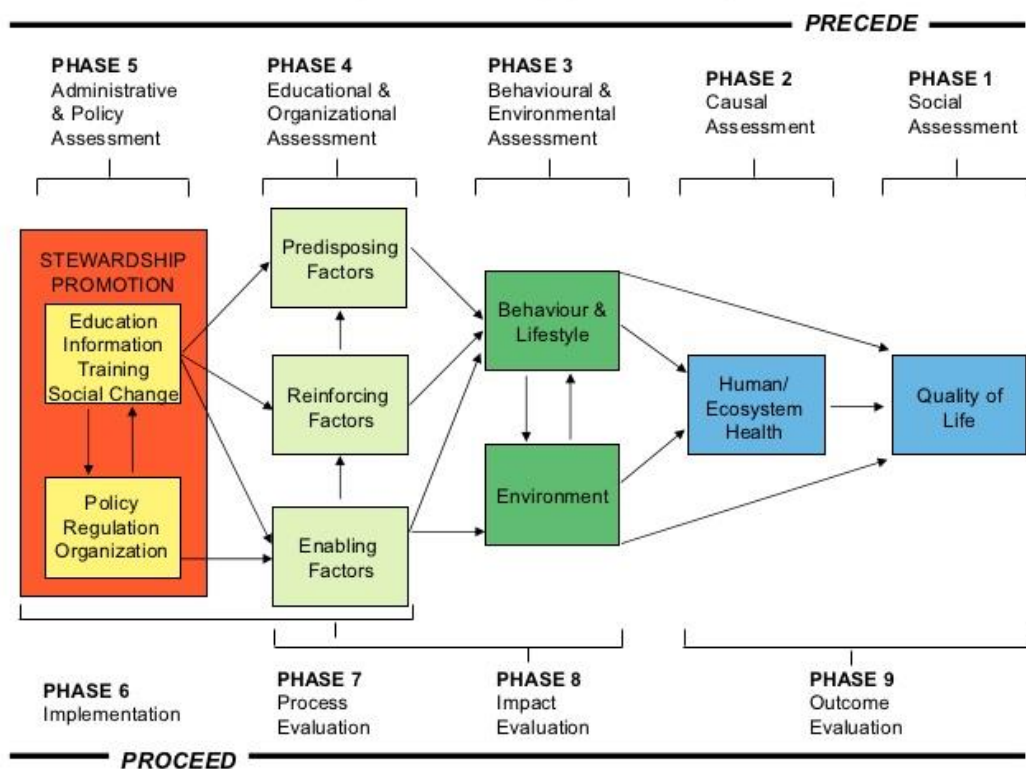
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Appendix A: Conceptual Model

PRECEDE-PROCEED MODEL



after Green & Kreuter 1999

Appendix B: UAA IRB Exemption Document

**Research &
Graduate Studies**
UNIVERSITY of ALASKA ANCHORAGE

3211 Providence Drive
Anchorage, Alaska 99508-4614
T 907.786.1099, F 907.786.1791
www.uaa.alaska.edu/research/ric

DATE: March 20, 2015

TO: Jeremy Rosiecki
FROM: University of Alaska Anchorage IRB

PROJECT TITLE: [635746-2] Needs Assessment for a Patient Centered Medical Home Model of Care at the Providence Alaska Cancer Center

SUBMISSION TYPE: Revision

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: March 19, 2015

Your Institutional Review Board (IRB) proposal meets the U.S. Department of Health and Human Services requirements for the protection of human research subjects (45 CFR 46 as amended/revised) as being exempt from full Board review. In keeping with the usual policies and procedures of the IRB, your research project is approved with suggested revisions. Thank you for a copy of these revisions.

Therefore, you have permission to begin data collection for your study. If this study goes beyond one year from the date of this submission, you will need to submit a Progress Report for approval to continue the research. Please submit a Final Report at the end of your project.

Please report promptly proposed changes in the research protocol for IRB review and approval.

On behalf of the Board, I wish to extend my best wishes for success in accomplishing the objectives of your study.

Sharilyn Mumaw, M.P.A.

Research Integrity & Compliance Officer

Appendix C: Providence Waiver of IRB Jurisdiction



March 24, 2015

Stacey Medeiros
Providence Health System, Alaska Region
3200 Providence Drive
Tower A, Basement 055
Anchorage, AK 99508

Dear Ms. Medeiros:

SUBJECT: WAIVER OF IRB JURISDICTION
Investigator: Jeremy Rosiecki, BS
Protocol Title: Needs Assessment for a Patient Centered Medical Home Model of
Care at the Providence Alaska Cancer Center

This is in regard to your request for waiver of jurisdiction by Western Institutional Review Board (WIRB) for approval to conduct the above-referenced research project.

WIRB agrees to waive jurisdiction for the IRB review and continuing oversight of the above-referenced research study to the **University of Alaska Anchorage IRB**, as allowed under 21 CFR 56.114 and 45 CFR 46.114.

If you have any questions, please contact me at (360) 252-2852.

Sincerely,

R. Bert Wilkins, J.D., M.H.A.
Executive IRB Chair

RBW:JCA

cc: David Forster, J.D., M.A., C.I.P., Chief Compliance Officer
Elaine J. Azarenko, C.I.P., Associate Director, Institutions
Company File #3655
WIRB Follow-Up #380547

Western Institutional Review Board®

1019 39th Avenue SE | Puyallup, WA 98374

Office: (360) 252-2500 | Fax: (360) 252-2498 | www.wirb.com

Appendix D: Providence Consent Form



CONDITIONS OF ADMISSION - ENGLISH

1. CONSENT FOR SERVICE

I acknowledge my attending physician is responsible for directing my care and has advised me of the need for services such as nursing care, diagnostic tests, anesthesia, medical or surgical treatments, disposal of removed tissue, services for any newborn if appropriate, and any other necessary medical service. By signing below I give my consent to all such services instructed by my attending physician, his/her assistants or designees. I understand my physician may order an operation or procedure, and give my consent after receiving adequate advice as to the benefits and risks of such operation or procedure. In the event a healthcare worker is exposed to my blood or body fluid in a manner posing a risk for transmission of a blood-borne infection, I give my consent to be tested for infections such as HIV, Hepatitis B and Hepatitis C at no cost to me, so the healthcare worker may be treated promptly. In such situations, I authorize release of applicable information to the healthcare worker and his/her healthcare provider.

2. USE AND DISCLOSURE OF INFORMATION

I have received and read the "Notice of Privacy Practices" and authorize Providence Health and Services (PH&S) to use and disclose information about me and my health to diagnose and treat me, to obtain payment for my care and for PH&S business operations.

3. PH&S TEACHING FACILITIES

I acknowledge PH&S has teaching facilities, and consent to supervised residents and students being involved with my care. I acknowledge I may refuse care by a resident or student at any time, and that such refusal will not result in any reduction of the quality of care provided.

4. NURSING CARE

I acknowledge PH&S offsite hospital facilities do not provide general duty nursing care and release PH&S from all liability for special duty services that may be arranged by me/my legal representative.

5. HEALTH PLAN OBLIGATION

I acknowledge I am individually obligated to pay the full charges of all services rendered to me by PH&S if I belong to a health plan that does not have a contract with PH&S at the time services are provided.

6. ASSIGNMENT OF BENEFITS/RELEASE OF INFORMATION

Medicare / Medicaid and Other Government Programs: I authorize PH&S to receive direct payments for any benefits to which I may be eligible under Medicare, Medicaid or any other government program, and authorize PH&S to release relevant information about me and my healthcare necessary to receive payment under the applicable government program(s). I understand and accept my responsibility to pay any deductible and/or co-insurance under such program(s).

Medicare Notice: I understand I may receive a bill from PH&S for self-administered drugs not covered by Medicare Part A, B and C, and may request an itemized statement containing the national drug codes necessary for me to bill my Part D carrier.

Insurance: I consent to assign to PH&S all insurance company coverage benefits to which I am entitled for services rendered by PH&S, and authorize PH&S to release relevant information about me and my healthcare to receive such payment. I understand and accept I am responsible for paying any co-payments and/or deductibles required under my insurance plan(s).

7. Right to Revoke Consent: I acknowledge I have the right to revoke consent to treatment at any time effective immediately, and may also revoke authorization for the release of information about me and my healthcare to relevant government programs and insurance company(s). I understand and accept such revocation must be in writing and is effective only when it is received by the Medical Record Department at PH&S. I understand and accept if my revocation results in denial of payment to PH&S, I am responsible to pay for the care provided by PH&S.

8. CHARITY CARE AND UNINSURED PATIENT DISCOUNTS

I acknowledge PH&S offers charity care, discounts for uninsured patients and prompt pay hardship discounts to qualifying individuals, and understand that I may request information regarding discounts where appropriate.

9. FINANCIAL RESPONSIBILITY

I understand and accept: PH&S will bill the Charge Master rates in effect when services are provided; I may request a price estimate for such services; I agree to pay for such services; and I acknowledge and accept my personal responsibility for payment in full for billed charges even where PH&S has been assigned benefits from government programs and insurance companies. I acknowledge failure to meet my financial obligations to PH&S will result in the referral of account(s) to professional collection agencies and consent to PH&S or its designees obtaining a copy of my credit report or any other publicly available data related to my ability to pay. I understand that PH&S, its affiliates, agents or designees may contact me using pre-recorded/artificial voice messages and/or automatic dialing services at any telephone number I provide to PH&S. In the event of any dispute regarding payment, I agree to pay all collection costs and attorneys' fees whether or not a case is filed in court. I understand I may receive separate bills from PH&S and/or from treating physicians such as radiologists, pathologists, anesthesiologists and emergency room physicians, and accept my responsibility to pay these in accordance with the payment terms set by those providers. If I am entitled to any personal injury settlement, judgment or other payment I agree to take any and all actions to assign or have paid to PH&S balances owed by me.

10. PERSONAL BELONGINGS AND VALUABLES

I agree that PH&S is not responsible for my personal belongings and valuables brought into a PH&S facility, and agree to send such items home with my family or other responsible party if possible. I accept full responsibility and hold PH&S harmless for any loss, theft or damage for personal belongings or valuables retained at a PH&S facility.

11. SAFE ENVIRONMENT

I acknowledge that weapons or other dangerous objects, illegal drugs and medications not prescribed by my healthcare provider are not permitted on PH&S premises, and accept the rights of PH&S to search individuals and rooms upon reasonable cause and to confiscate any such items.

12. PHOTOGRAPHS

I agree to allow PH&S to take, reproduce and use photos, video tape, video monitoring / recording, or audio recording for the purpose of diagnosis, testing, medical evaluation, care or treatment (including invasive procedures), patient safety or medical education, and to preserve clinical information. I understand that this material may be treated as a part of my medical record and that PH&S privacy policies apply.

13. PATIENT RIGHTS AND RESPONSIBILITIES

I acknowledge that I have received and read the "Patient Rights and Responsibilities" notice provided by PH&S.

14. NONDISCRIMINATION POLICY

I acknowledge PH&S prohibits discrimination based on age, race, ethnicity, religion, culture, language, physical or mental disability, socioeconomic status, sex, sexual orientation, and gender identity or expression.

AUTHORIZATION FOR TREATMENT AND FINANCIAL RESPONSIBILITY STATEMENT

I have read, or have had explained to me, the above Conditions of Admission including without limitation the financial responsibility, release of information, and treatment provisions. I understand the contents of this Conditions of Admission document and by signing; I agree to be legally bound by this document.

By signing this document, I certify that I am of lawful age and legally competent to consent to these terms of admission.

Patient / Personal Representative Signature:

Date/Time Signed:

Providence Health & Services includes our hospitals, clinics, outpatient services, home and community services, retail pharmacies, and skilled nursing facilities.

Appendix E: Data Collection Spreadsheet

[illegible]